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The Use of Synthetic Medium Tuberculin in the Application of the Double Intradermal Tuberculin Test*

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As a result of certain difficulties which arose in the application of the double intradermal test and which seemed to be attributable to the use of concentrated tuberculin, or "O.T." as it is called, it was decided to investigate the possibilities of preparing a simple form of this diagnostic agent. In the early stages a considerable amount of experimental work was necessary in order to determine whether the products which were being prepared were adequate for the purpose for which they were designed and certain modifications were introduced from time to time. Eventually a simple synthetic medium tuberculin was prepared which seemed to give satisfactory results and this has now been used extensively in the field during the past two or three years. It is probable that with further experience additional changes may be desirable: nevertheless, it is perhaps opportune, at the present moment, to give a brief summary of the impressions which have been gained in the course of these investigations.

Before discussing synthetic medium tuberculins, it may not be out of place to refer to "old" or "concentrated" tuberculin, although at this stage it is unnecessary to enter into any detailed description of this product. When properly prepared, "O.T." is a syrupy liquid, which should be entirely free from bacterial bodies, and contains certain substances elaborated by the organism during its growth, some of which are responsible for eliciting the characteristic response in tuberculous subjects. With a tuberculin of adequate potency it is but rarely that affected animals fail to give a positive reaction apart from the very advanced cases of the disease. Unfortunately, owing to its complex nature, the reactions which it induces in negative animals vary considerably in their size so that it has not always been easy to differentiate between the rather large negative and slightly diffuse positive reaction. This is a real difficulty which cannot be ignored and much of the criticism of the double intradermal test has centred around the significance of so-called border-line cases. There can be no doubt that on occasion genuine differences of opinion have arisen, although it is only fair to point out that not all of them are necessarily referable to the use of "O.T.," since there are other valid explanations which can be advanced.

With these drawbacks in mind, the problem arose as to whether any improvement could be effected either by the use of a purified form of "O.T.," or by the production of a less complex type of tuberculin. At the present moment, the nature of the fraction in tuberculin which is responsible for the specific reaction is not exactly known, but it is generally accepted that it is associated with the protein components.

It is evident, therefore, that some degree of purification of tuberculin should be attainable by separating the protein fraction with appropriate precipitants.

The results of the experiments which were undertaken at the Institute have already been published (Glover, 1933: Buxton and Glover, 1933). Briefly, our first efforts were directed towards a purification of "O.T." with the object of eliminating, if possible, the non-specific elements present in the complex meat infusion media which are in current use for its preparation. It was found that certain constituents of the medium itself were responsible for the large pea- or bean-like swelling which characterises the response in negative animals. Actually, the peptone, meat infusion and glycerine respectively, even in concentrated form, were of themselves incapable of inducing other than very small reactions in the skin, but in association, as for example in concentrated glycerine veal broth, substances were formed which were sometimes capable of inducing increases in measurement of the magnitude of 5 mm. or even more.

An attempt was, therefore, made to eliminate these unwanted components by a separation of the protein fraction. Table I gives in diagrammatic form the results of these experiments. The extent of the swellings induced in negative

*Précis of paper presented at a meeting of the Yorkshire Division, N.V.M.A., held at Wakefield, April 23rd, 1937.

Table I.

		Size of Swelling in Negative Animals.	Average Mean Rise.	Activity in Positive Animals.
Conc. glycerine broth		O	3–5 mm.	—
Old tuberculin		O	3–5 mm.	+++
Purified old tuberculin	Ammonium sulphate	o	2–3 mm.	+++
	Acids (HCl., etc.)...	°	1 mm.	+
	Alcohol	O	3–4 mm.	+++
	Acetone	o	2–3 mm.	++
	Ammonium sulphate followed by acetone	°	1 mm.	++

animals is indicated by circles of varying size, while the potency in tuberculous subjects is represented by a series of plus signs.

It is immediately apparent that no appreciable loss in potency follows the separation of the active fraction by such precipitants as ammonium sulphate, but there is a slight, although not a very significant, reduction in the non-specific substances. If the latter are still further reduced, *e.g.*, by acetone, then the tuberculin loses some of its activity. On the whole, the results suggested that the purification of "O.T.," at any rate for use in cattle, was not a practical proposition.

The problem was, therefore, attacked from another angle and efforts were made to prepare a tuberculin in a very simple medium which of itself would induce the minimum reaction in non-tuberculous animals. Attention was first directed to the value of a synthetic medium tuberculin for intradermal use by the late Dr. Dorset (1934) who in collaboration with Dr. Henley (1929) produced a potent tuberculin on a simple medium. This consisted of a solution of inorganic salts together with asparagin, glucose and glycerine and was entirely free from the complex proteid substances present in "old tuberculin."

This tuberculin was subjected to the same process as "O.T.," *i.e.*, growths of eight to ten weeks of age were filtered and concentrated *by heat*. During the past few years, a product of this type issued by the Bureau of Animal Industry has been extensively employed in the U.S.A. We have had an opportunity of testing batches of synthetic medium tuberculins which we have prepared according to this method and have found that in both tuberculous guinea-pigs and tuberculous cattle, they have given reactions which were just as good as those induced by a standard old tuberculin. They possessed the additional advantage that there was a considerable reduction in the non-specific reaction and this was of material aid in the interpretation of the test. It will be noted, however, that a heat-concentrated synthetic medium tuberculin contains, in addition to the active principle, the unused mineral components of the medium together with other products which may be elaborated by the organism during its growth but are not necessarily associated with tuberculin activity. Whilst, therefore, a heat-concentrated synthetic medium tuberculin represents a marked advance, it was felt that it would be still more satisfactory to free the tuberculin from the products which have just been mentioned.

After a considerable amount of experimental work, the following method was finally adopted. Suitable strains of the tubercle bacillus are cultivated on a simple synthetic medium for eight to ten weeks. The culture is then steamed, filtered, and the active principle separated by saturating the filtrate with ammonium sulphate. The precipitate is then collected, redissolved in a glycerolated solution so that it is 20 times the concentration of the original fluid, passed through a bacterial candle and preserved with an appropriate amount of merthiolate. The final step consists in a test for potency in tuberculous cattle, a comparison being made with equivalent amounts of a standard tuberculin. Non-tuberculous cattle are injected at the same time to ensure a freedom of the preparation from undesirable non-specific actions. Synthetic medium tuberculin as prepared in this manner is an almost water-clear, slightly viscous fluid.

Agents other than ammonium sulphate can be used for removing the active principle and Table II shows the results obtained with various substances on synthetic medium tuberculin.

It is quite evident that the separation of the tuberculin protein by saturation with ammonium sulphate or by precipitation on benzoic acid according to the method of Gough (1934) yields a product which induces a very small reaction in negative cattle, but yet retains its full potency for affected animals. Still further reduction in the non-specific skin reactivity can be effected by additional purification with alcohol or acetone, but this may result in some slight loss in potency.

Under these circumstances, at the present

Table II.

		Size of Swelling in Negative Animals.	Average Mean Rise.	Activity in Positive Animals.
Synthetic medium tuberculin	Heat concentrated	O	3 mm.	+++
	Ammonium sulphate	O	1–2 mm.	+++
	Benzoic acid	O	1–2 mm.	+++
	Alcohol	o	1 mm.	++
	Acetone	o	1 mm.	++

moment the ammonium sulphate method is preferred. Nevertheless, while we are of the opinion that a tuberculin of this type does present definite advantages over "O.T.," we do not doubt that in the course of time other improvements will be introduced and no suggestion is made that finality has been reached. It is perhaps advisable to point out, however, that in preparing these tuberculins it seems impossible to give universal satisfaction owing to the fact that practitioners are by no means unanimous as to what constitutes the most useful form of tuberculin. Thus we find that one section demands a product which is entirely without action on the skin of negative animals while another complains that in its present form synthetic medium tuberculin does not induce a sufficient reaction so that difficulty may be experienced in deciding where the second injection shall be made. It is possible by further purification of synthetic medium tuberculin to secure a product which is practically without action on the normal skin. Theoretically, this might be regarded as the ideal at which to aim, but in practice it is highly probable that a preparation which induces the formation of at least a small pea will meet with the most universal satisfaction.

Synthetic medium tuberculin has now been employed on an extensive scale in this country during the past two to three years and it can reasonably be claimed that on the whole the results have been encouraging. An extremely useful résumé of the precautions which should be observed in applying the double intradermal test with synthetic medium tuberculin has recently been provided by Jordan (1937) in a communication presented to the Southern Counties Division. The salient points are admirably set out in this paper and no useful purpose would be served by their reiteration. It may be emphasised, however, for those practitioners who have been employing "O.T.," that some reorientation of ideas may be necessary. They will have become accustomed to the large pea- or small bean-like swelling in negative cattle. In positive animals, this basic swelling is augmented by the oedematous reaction which constitutes the specific response, but the central "core" is usually clearly palpable. With synthetic medium tuberculin there is a distinct difference. In negative cattle the non-specific reaction is reduced to a minimum, while in tuberculous cattle, owing to the absence of the basic response, the reaction is usually of the flat diffuse type. On account of this difference between the two types of tuberculin, the increases in skin measurements to synthetic medium tuberculin are not so pronounced. It must be emphasised, however, that the *character* of the swellings in positive animals is not altered. The presence or absence of diffusion is still the deciding factor. A series of experiments in laboratory animals supplemented by observations in infected herds which were kindly undertaken for us by several practitioners and whole-time officers and which have already been recorded (Buxton and Glover, 1933) have clearly shown that there is an appreciable reduction in the average mean rise in skin measurements in negative animals. Thus in a series of 915 cattle tested simultaneously with "old" and synthetic medium tuberculins the average increases in skin measurements for negative animals were 3·2 mm. and 2·2 mm. respectively, while the corresponding figures in positive animals were 13·0 mm. and 12·9 mm.

So far it has not been possible to obtain any extensive *post-mortem* evidence of the relative value of these two products in the detection of infection. Tweed (1936) completed a comparative test on 36 animals which were immediately slaughtered. Twenty-six gave definite reactions to both tuberculins and tuberculous lesions were found in 25 of these. No lesions were found in two animals which were negative to synthetic medium tuberculin but were doubtful to "O.T.," while one animal which was doubtful to both showed a single calcified lesion. The remaining animals, seven in number, were negative to both tuberculins: four were free from visible lesions, one was an advanced case of the disease and two showed inactive calcified lesions.

This short note is presented with the object of drawing attention to the value of synthetic medium tuberculin in the interpretation of the double intradermal test. More recent investigations with this form of tuberculin have enabled

(*Continued at foot of col.* 1, *p.* 948.)

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The Veterinarian in Our Colonies

ELSEWHERE in this edition will be found a review of Mr. Swynnerton's contribution to the Royal Entomological Society and a reference to the assistance which has been given by Colonial veterinary officers in the work of tsetse fly control. Unfortunately only a limited number of our readers have an opportunity of seeing the annual reports of Colonial veterinary departments and realising how many and varied are the duties which they are carrying out in the general progress of our Colonies. It is sometimes astonishing to read of the various projects to which their aid has been given and the success which has been achieved. The veterinarian who contemplates working in the Colonies must be ready to adapt himself in many different ways if he is to be of the greatest service. First of all, he must realise that he is faced with two distinct sets of problems; those of the indigenous peoples, often quite backward, and those connected with the European settler. Both call for tact, patience and judgment. One of the principal tasks is, of course, the control of disease. In this he is seldom called upon to treat individual animals; he deals with very large herds scattered over wide areas. Considerable organising ability is required in this work, particularly when large-scale inoculations are carried out. When thousands of animals have to be assembled at different places within an area, problems of water, pasturage and the like, present no small difficulties. Arrangements for handling these half-wild cattle require the greatest care and preparation. Of equal importance is the educational work which is undertaken. The foundation of the clean and healthy herds of the future must be laid upon a great improvement in the methods of animal management obvious to-day amongst the native-owned herds. The principles of selection of the best animals as breeding stock, the elimination of the unfit, the sanitary penning during the night, the choice of good grazing grounds and the preservation of others for the periods of shortage, all must be constantly stressed—by no means an easy task amongst peoples who cannot, as yet, easily grasp the reasons for the suggestions made. Instruction in proper flaying and treatment of hides and skins has been of the greatest economic importance to many Colonies and has resulted in establishing an industry which is of benefit to many. The organising, and control, of the flow of animals towards markets has been undertaken by the veterinary departments and has resulted in stimulating demand and in opening out new sources of disposal not previously recognised but now of proved present and potential value. Instruction in ghee and butter making is meeting with success, whilst the establishment of creameries has opened out a constant and much needed source of income to thousands.

It will be recognised that such varied work calls for great effort on the part of the veterinarian who is in charge of a large district, and for assistance from all sources if success is to continue and the field of operations widened. The part which the natives of the Colonies must play in these schemes for advancement was early recognised and has led to the establishment of schools where training is given by veterinary officers according to the capacity of the students. Some are able only to absorb sufficient to fit them for the most simple tasks; others have shown aptitude which has resulted in a lengthening and widening of the course and the production of more efficient assistants. Indeed, this effort to enable some of the natives to take a more and more important part in the work of advancing their less enlightened brethren is likely to assist very materially the progress of the future. In his work amongst the stock

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us to complete a series of experiments on certain important aspects of the test in connection with cross-reactions with different acid-fast organisms, local sensitisation and desensitisation, etc. These observations will be reported later in a more detailed article.

In conclusion, it is a pleasure to express my thanks to Professor J. B. Buxton for his continued encouragement and valuable criticism.

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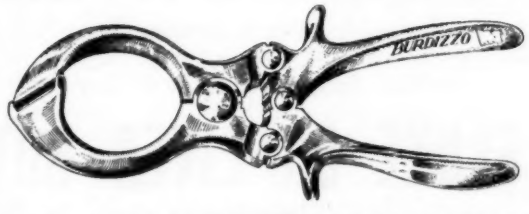

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of the Europeans, the veterinarian is confronted with the problem of maintaining pure-bred, or highly graded, stock under conditions entirely foreign to them. Instruction in management, too, is necessary, for some of the settlers engaged in the cattle or sheep industries have had little previous experience. In the various services connected with the health of the people, the veterinary officers play their part and instances are not wanting where, in the absence of their medical confrères, they have undertaken treatments which have earned for them respect and gratitude.

The objective of the veterinarian in our Colonies is the establishment of a sound animal industry. The problems vary; in some Colonies, a preponderance of poor, often half-starved, animals is found, and, at present, totally insufficient markets; in others, similar animals, but markets which can only be met by importation of better-class stock. In practically all, however, the principal problem is the same —a substitution of quality for quantity. Simple improvement of the animals themselves is quite insufficient. Conditions must be created in which the improved stock can thrive.

In this work, the most complete liaison of the veterinarian, the agriculturist, the political and education officers, must be established, for a long and arduous task confronts them. It is impossible, in one leading article, to do more than indicate the directions in which the veterinarian in our Colonies is turning his thoughts and energies. The tasks themselves are difficult and are, in many cases, increased by insufficient staff, a lack of adequate funds and a feeling that the efforts made are not always appreciated. The Lovatt report indicated in what directions changes should be made to put the Colonial Veterinary Service upon a satisfactory basis. The recommendations have by no means all been implemented. The service has no officer of its own at the Colonial Office to look after its interests, further its opportunities, and co-ordinate its efforts. In the report mentioned the service was said to be regarded in the light of a "Cinderella" among other branches. Up to now, there have been few signs that the fairy godmother is approaching to make possible a better future. The best augury for the future is the fact that, in spite of the effect of the disappointments which all members of the staffs must have felt, they have not allowed it to interfere with the work which has been undertaken or the plans they have made for the future. Such an attitude must have its reward.

REVIEW

[The Tsetse Flies of East Africa. A First Study of their Ecology, with a view to their Control. By C. F. M. Swynnerton, Director, Tetse Research Department, Tanganyika Territory. *Trans. R. Ent. Soc. Lond.* 84. xxxvi. 579. 29 pp., 23 pls., 33 figs., 7 maps. London. November, 1936. Price £5 10s.]

In a preface to this monumental work the Right Hon. W. Ormsby-Gore, M.P., Secretary of State for the Colonies, points out that "there is scarcely a question of greater importance for the future development and well-being of the British and other territories" than the problem of the tsetse fly in East Africa. He says "the future prosperity of considerable tracts of Africa depends on whether it will be found possible with the aid of science to devise means by which they can be inhabited by man and his domestic animals without risk of infection by human or animal trypanosomiasis." As one who has travelled in British East African territories and was at one time an enthusiastic Chairman of the Tsetse Fly Committee of the Economic Advisory Council, Mr. Ormsby-Gore is well qualified to appreciate the value of Mr. Swynnerton's work.

It was Carlyle who said "genius means the transcendent capacity of taking trouble" and if this definition is accepted, one has to admit that Mr. Swynnerton is indeed a genius, for this lengthy work of nearly 600 pages, full of the details and information he has diligently collected during the past 25 years, is evidence that he has taken infinite trouble. So comprehensive is the knowledge he has acquired and assembled in his *magnum opus* that one wishes that an index rendered it more easily accessible: and as the information will be required chiefly by workers "in the field" it is to be regretted that a more substantial binding is not provided to prevent the pages falling apart so easily. But these are merely minor complaints: the information is there if one cares to seek it, expressed clearly and fairly, with due credit given to those who assisted in obtaining it.

The book is made up of 13 parts and each of these is minutely sub-divided. There are ten appendices, a list of 66 tables, 33 figures and 22 plates which are not only artistic but most instructive. The titles of the headings give some idea of the scope of the work.

Part 1.—Introductory, Financial and Administrative.
" 2.—The investigation of the habits and ecology of Tsetse Flies as a means for devising their destruction.
" 3.—Experimentation in attack.
" 4.—Observation and experimentation directed to the production of an absolute Fly barrier.

Part 5.—Survey.
„ 6.—Reclamation and settlement, water supply, and some reclamation techniques.
„ 7.—Defence against Fly advances.
„ 8.—Co-operation with British and Foreign territories and with Authorities in the Tanganyika Territory.
„ 9.—Other matters of interest.
„ 10.—Acknowledgements.
„ 11.—Discussions of the prospects and needs of the work.
„ 12.—General Summary.
„ 13.—Concluding Note.

Each of these sections is sub-divided and contains so much detail that the reviewer must reluctantly leave it to those interested to study the original.

At the commencement of the book Mr. Swynnerton reminds us that by far the greater part of tropical Africa, amounting to some four and a half million square miles, is under infestation by the tsetse. In the greater parts of this area cattle cannot be kept, and in much of it sleeping sickness still takes its toll of the human population despite the high efficacy of modern drugs and a huge expenditure on staff and organisation, treatment and segregation, in the various countries concerned. He defines the geographical distribution of the tsetse and states that an area about 2,000 miles wide is infested with one or other of the 21 species of tsetse fly. As much of this vast area is still in its primitive state and almost inaccessible, the control of the many species of tsetse, each with its own habits and idiosyncrasies, would appear to be an almost impossible task. Moreover, Mr. Swynnerton reminds us that "if we are prepared to do our duty to the country reclaimed . . . we are justified in attacking the tsetse. Otherwise we are not."

Experimental efforts to this end are not carried out without some expense. For example, in Tanganyika expenditure on this work amounts to £15,000 a year, of which £750 is provided by the Tanganyika Territory and £14,250 by the Colonial Development Fund—a sum which, in the opinion of the reviewer, is totally inadequate, and quite out of proportion to the benefits it is sought to derive. It would also appear that the accommodation and facilities provided for the workers are not all they should be. Mr. Swynnerton states: "In general, we are very badly housed compared with any other department or investigation, and the water supply is bad, but, with all too little money for the work, our members have gladly tolerated, for its sake, a considerable amount of discomfort."

If this work is to be successfully accomplished, the "powers that be" should realise that the "workman is worthy of his hire" and should be protected as far as possible from the dangers and vicissitudes associated with research of this nature.

It would be impossible in the space available to deal at length with the innumerable observations made by Mr. Swynnerton and his co-workers on the different species of tsetse, and the various measures adopted with a view to finding an effective method of controlling them. As one entomologist has expressed it, "The tsetse fly is very delicately poised in the balance of nature" and one gathers that the object in view has been to study each species so carefully and minutely that some weak link in the chain upon which this balance depends may be discovered. Various ingenious methods based upon the knowledge acquired have been devised, with more or less success.

The broad policy of tsetse control in the future is discussed. It would appear that there are three schools of thought, namely:—

(1) Those who favour evacuation of the fly country generally in favour of concentrated settlement;

(2) those who asseverate that only by a holocaust of the game animals can the tsetse be destroyed; and

(3) those who, like Swynnerton, have become optimistic regarding their power to expel the flies from large areas of bush without destroying the wooding, and who advocate a nice balance between accessibility of native settlement to the public services and utilisation by it of wide areas of country. The interpretation of this sentence should be sought in the original.

Immunisation of stock is also referred to, but is disposed of with faint praise, although, we believe, it is as the result of "immunity tolerance" that the wild animals and certain breeds of cattle survive in tsetse-infested areas.

Mr. Swynnerton's valuable work will be of the greatest assistance to field workers and it is hoped that free copies will be issued on request as the price somewhat exceeds the slender resources of many of them.

At the recently held International Grassland Congress Mr. C. R. Enlow, Washington, U.S.A., Agricultural Agronomy Department, spoke on pasture improvement in relation to erosion control in the United States, and declared that 100,000,000 acres were already worthless for continued cropping, due to erosion, and a further 100,000,000 were rapidly deteriorating. Erosion was active because of over-grazing and improper management, and as the grassland in the Eastern States was deficient in lime, phosphate, and nitrogen it was impossible to produce a heavy turf to prevent soil losses without first making up mineral deficiencies. The programme was primarily to restore a heavy cover of vegetation.

CLINICAL COMMUNICATIONS*

Notes on the Use of Swine Fever Antiserum in an Outbreak of the Disease

R. CRAIG ROBINSON, M.R.C.V.S.
CARLISLE

[It has long been recognised that swine fever antiserum will protect susceptible animals against artificial or natural infection for some three to four weeks, and that apparently also the serum possesses some curative and protective action on pigs in the incubation stage. It had also been observed that in infected herds pigs which have been protected by serum acquired an active immunity; this led to the employment of the "simultaneous serum-virus method" of immunisation, which has been widely employed in America, Germany and other countries.

Mr. Craig Robinson here records his observations on the use of swine fever antiserum in an infected herd in this country.—*Editor.*]

Subjects.—One hundred and twenty pigs of varying ages, housed and reared on an intensive system, six to twelve pigs being in each compartment of roughly 80 sq. ft. floor space.

History of Outbreak.—Several pigs in the same piggery had died after varying periods of illness, the symptoms being such as would lead one to suspect swine fever. Due notification of the existence of the suspected disease had been made and the material collected from several of the pigs at *post-mortem* examination had been sent to the Ministry of Agriculture's Veterinary Laboratory for investigation. However, up to the time of visiting the farm no positive diagnosis had been made.

The owners of the farm requested that an effort be made to limit the spread of the disease, which appeared to be definitely of a contagious or infectious nature. It was decided to inoculate swine fever antiserum into all pigs which had been in contact with cases or suspected cases of the disease. Strict isolation of pigs showing any clinical signs had been advised and carried out.

Clinical Examination.—All pigs which had been in contact with, or had occupied the same house as, affected animals were examined clinically and their temperatures were recorded. One hundred and five of the 120 examined were found to have temperatures of less than 102·5°F. Two pigs were selected in addition for the purpose of assessing the curative action of the antiserum, one having a temperature of 103·5°F. and the other of 103·8°F. Both of these pigs showed other clinical signs of the disease.

Inoculation of Antiserum.—The 107 pigs, which were in four different widely separated houses, were inoculated subcutaneously on the inside of the thigh with doses of antiserum regulated according to the size of the animal. The largest pigs received doses up to 30 c.c., while the smaller ones, of 30 to 35 lb. weight, received 22 c.c. The two clinically affected pigs received 30 c.c. doses.

Subsequent History.—The disease was later confirmed as an outbreak of swine fever by the Ministry of Agriculture's Veterinary Laboratory.

The hope was entertained that the inoculated pigs would acquire a solid active immunity as a result of contact with the virus while they were still protected passively by the antiserum. At all events, none of the pigs the temperatures of which were below 102·5° F. at the time of the injection of serum later showed any untoward symptoms. One would therefore be justified in concluding that prompt use of the antiserum protected them and thus avoided serious loss and inconvenience to the owners. The outbreak was checked and no further cases have been notified since that time, now nearly three months ago.

As regards the two clinically affected pigs which had been treated with serum, one died some few days later, while the other subsequently recovered.

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Notes on a Congenital Cardiac Abnormality in a Calf

J. C. BENNISON, M.R.C.V.S., D.V.S.M. (VICT.)
ASSISTANT COUNTY VETERINARY OFFICER,
CUMBERLAND

A recent notice in the local Press that a calf with the heart situated in the neck had been born on the premises of a Cumberland farmer aroused my interest.

History.—In the course of a conversation with the farmer the following history was ascertained. A bull calf by a Friesian bull out of a Shorthorn cow had been born after slight traction to a normal presentation seven days previously. The farmer had experienced considerable difficulty in stimulating respiration, but immediately after doing so he had noticed a pulsating swelling in the neck. During the

*Communicated to the Dumfries and Galloway Veterinary Medical Association (Division, N.V.M.A.) at a meeting held in Carlisle, April 29th, 1937. Received for publication June 22nd.

following seven days the calf appeared normal with the exception that an occasional cough was noted and that the faeces consisted of only partially digested milk.

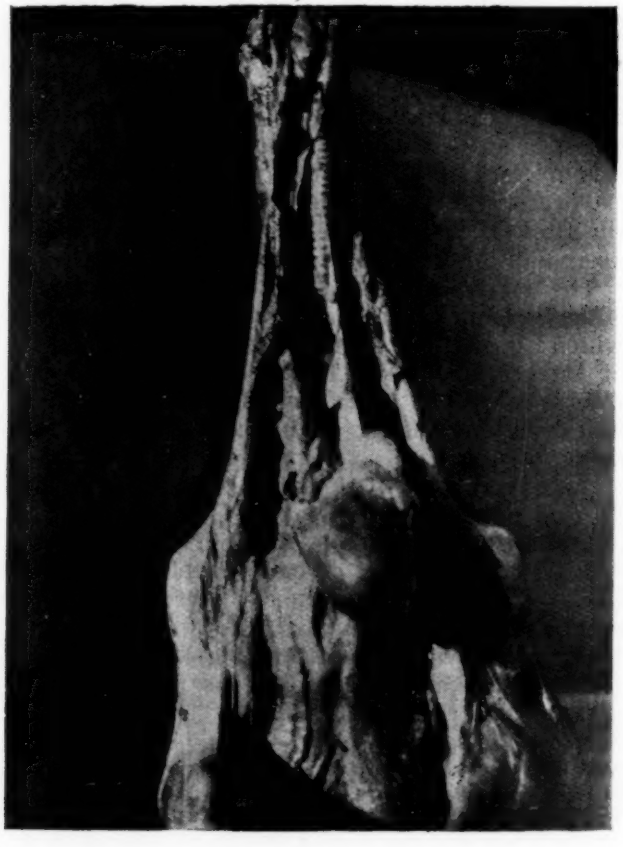
Clinical examination of the week-old calf revealed a pulsating enlargement situated at the base of the neck immediately anterior to the presternum and more pronounced to the left of the middle line. The size of the enlargement was approximately 4 in. square, and the nature of it left no doubt that it was the heart. A hand was placed gently around the area and the heart-beats could be easily felt. These were counted and found to be 124 to 126 per minute. An attempt was then made to feel the heart-beat on the left side of the chest but none was evident. Auscultation revealed the presence of two apparently normal lungs in the correct situation. A complete external examination was made but no other abnormality was found. The calf moved about the pen and took food normally. The carriage of the head and neck did not attract my attention.

Eight days after this examination the calf was found dead. It had therefore lived for 14 days.

Post-mortem Examination.—This was carried out, but not before considerable decomposition had set in. In doing so, particular search was made for any sign of bruising over the enlargement, as it had been anticipated that the calf might die suddenly from an external injury near to the site of the heart. This was found not to be the case nor had rupture of either the heart or vessels taken place. The pericardial sac was situated in the site indicated in the clinical examination. The parietal layer was in contact with the trachea, oesophagus and the lateral cervical group of muscles. It extended posteriorly as far as the sternum. A small quantity of fluid was found in the pericardium but there was no sign of pericarditis.

The heart itself was less conical in shape than normal and somewhat flattened dorso-ventrally; in general appearance it was larger than the normal size for a calf of this age. It is possible that this may be attributed to the extra-thoracic position and consequent lack of supporting tissue. The apex of the heart was found anteriorly. A distension of the pulmonary artery near to the conus arteriosus was palpated and it was found that the wall at this place was very thin.

There was full communication between the right and left auricles *via* the foramen ovale, but it must be borne in mind that in some cases the foramen persists to a variable extent in the adult without apparent disturbance to the circulation. As far as was possible a complete examination of the heart was made but no other abnormality was found. The valves and cusps appeared normal and the latter, when tested by means of a syphon of soda-water, acted in the approved manner.



The lungs were partly congested, the area in both lungs occupying the anterior third and apices.

As might be expected from the unusual position, the anterior vessels to the head and neck were shorter than the normal and the posterior trunks longer than normal.

It was originally intended to have the calf transported to Carlisle and exhibited in your presence, when a definite cause of death might have been detected or suggested. Frankly, I am at a loss as to the actual cause of death, though the abnormalities previously mentioned, namely, the patent foramen ovale and the thin-walled distension of the pulmonary artery, may have played a part; the *post-mortem* findings, however, can hardly be said to confirm this. It is left to the meeting to make suggestions as to the possible cause of death. It should be mentioned that the calves living under the same conditions of housing and feeding were healthy.

This is the only case of the kind that I have seen, although a case has been recorded where the heart was situated external to the ribs on the left side of the thorax. This calf lived for some months and was killed fat.

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Chronic Haematuria of Cattle

ENID A. R. BURNETT, M.R.C.V.S.
CALDERBRIDGE

This condition has been recognised on certain farms in the Fell district for innumerable years under the name of "Bray water." It occurs in well-defined areas, chiefly on upland farms, but in at least one instance has also appeared on a fairly good type of pasture land with no fell ground attached. The greater number of cases seem to occur either towards the end of the summer or shortly after the cattle are housed. Cattle of any age may be attacked, but the greatest prevalence is among cattle that have had one calf. Cases are very difficult to trace because, whenever possible, the owners dispose of affected beasts at the first opportunity.

In the early stages intermittent haematuria is observed with no general symptoms; this clears up spontaneously without treatment and a period of months may elapse before the second attack occurs. In the few cases I have been able to watch, the disease has progressed in the following manner. A second attack always occurs with varying length of time between according to the stamina of the affected animal. After several attacks the haemorrhage becomes severe and blood clots are formed, blocking the urethra and causing serious symptoms through retention of urine. Finally, the animal dies through exhaustion or, in some cases, from uraemia.

In one of the positive *post-mortem* examinations I have performed the bladder was filled with blood clots and the lining showed patchy inflammation but no papilliform growths. All the organs were anaemic but otherwise showed no gross changes.

Treatment has apparently little or no influence on the course of the disease, though it may relieve the acute symptoms and increase the general resistance of the animals. I have tried all the usual treatments for cystitis and for severe haemorrhages, with very little success.

In the later stages irrigation of the bladder with saline, or in advanced cases adrenalin solution, relieves the immediate symptoms.

In most cases the disease is very slowly progressive and the affected animal may thrive and milk well for a long time before general symptoms appear. Whether all affected animals finally die of the disease or not it is impossible to say as early disposal is the usual procedure and advanced cases are rarely seen.

Whatever the cause, it seems that the bladder is the predilection seat and that other organs are secondarily affected. Urine tests reveal nothing special and blood tests before severe haemorrhage sets in are also negative. Poor pasturage is apparently the main cause, but among similar neighbouring farms one may have many cases and the other none.

LIVESTOCK COMMISSION APPOINTED

Reviewing the Industry

The Royal Assent having been given to the Livestock Industry Bill, which provides for the constitution of a livestock commission, the Minister of Agriculture, the Secretary of State for Scotland, and the Home Secretary have appointed the following to be members of the Commission: Lieut.-Colonel Sir John Chancellor (Chairman), Sir Francis Boys, Mr. George Dallas, Sir Robert Greig, Sir Harold Howitt, Sir John Boyd Orr and Mr. Jasper Ridley.

The Commission are charged with the functions of keeping generally under review the production, marketing and slaughtering of livestock, the preparation for sale of the products of the slaughtering of livestock, and the marketing, consumption, treatment and use of such products. It will be their duty to advise and assist Ministers in matters relating to the livestock industry, and administer the cattle subsidy. All have been members of the Cattle Committee, set up in 1934.

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Erratum.—We regret that the clinical communication published in our last issue, "Adder Bite in an Irish Wolfhound," was incorrectly attributed to Miss Audrey V. Hickman, M.R.C.V.S. The author of this contribution was Miss Vera C. Hickman, M.R.C.V.S.

ABSTRACTS

[**Experiences in the Value of the Tuberculin Test.** Feraug, E. (1936.) *Ann. Méd. vét.* **81.** 5. 199-208.]

Comparison of the value of the conjunctival and double intradermal tuberculin tests was made in a series of 40 bovines. Of these, 32 gave positive conjunctival reactions. Tested by the double intradermal method, 29 gave positive reactions [a two-fold increase of thickness of the skin-fold being the criterion taken]. Four of the remaining animals gave doubtful reactions as regards the thickness of skin but were judged positive on account of the character of the swelling. The authors conclude that the conjunctival test is as valuable as the intradermal test provided the animals to be tested are kept under good conditions [*e.g.*, in a quarantine station] and non-specific eye trouble is absent. The double intradermal method gives results which are not influenced by fraudulent attempt to desensitise reactors.

E. J. P.

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[**Lesions Produced in the Organs of the Rabbit by Single and Repeated Intravenous Injections of B C G: A Preliminary Note.** Innes, J. R. M. *Proc. Roy. Soc. Med.* **30.** 7.]

In the course of experiments on the development of immunity in calves inoculated intravenously with B C G it was decided to carry out intravenous injections in rabbits in order to clear up certain features of vaccination in calves as well as to throw light on the genesis of tubercles. Ninety rabbits were used and were killed at periods which varied from 24 hours to 290 days after receiving graded doses of B C G, varying from 0·005 to 10 mg. The development of tubercles was studied by histological methods, particular attention being paid to the lungs and tracheo-bronchial lymph glands. Full details of the histogenesis are given. Classical tubercles were found in the lungs 12 to 21 days after the inoculation. It was found that whilst most tubercles later disappear from the lungs, some may persist for as long as 205 days—much longer than previously suspected. Acid-fast bacilli could be demonstrated in sections of the lesions 114 days after injection, but since it was not possible to recover them by cultural methods later than 62 days, it is assumed that most of them were no longer viable.

A small number of reinoculated animals died following the second injection; there was marked consolidation of both lungs. The reaction in the surviving animals resembled that in those inoculated for the first time.

It is tentatively suggested that the immunity resulting from B C G injections, *e.g.*, in calves, and lasting some months, may be due to a tissue reaction resembling the persistent tubercles in rabbits several months after injection.

E. G. W.

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[**An Outbreak of Milk-borne Scarlet Fever and Tonsillitis in Doncaster.** Watson, R. (1937.) *Brit. Med. J.* **I.** 1189.]

This is the first full official report of the milk-borne outbreak of scarlet fever and sore throat which occurred at Doncaster in December of 1936. The outbreak has twice been referred to in the *Veterinary Record* [**48.** 52. p. 1563, and **49.** 21. pp. 657-9]. The epidemic, though not unduly extensive, was of the typical "explosive" character generally associated with a faulty milk supply, and the source of trouble was quickly traced to a single farm supplying 50 gallons of milk daily to one retailer. This dairy supplied 380 families and in all about 1,300 persons were exposed to the risk of infection. Of these, 10 per cent. developed scarlet fever and a further 17 per cent. sore throat. It was considered that the incidence amongst adults was abnormally high for a milk-borne epidemic.

The source of contamination of the milk supply was found to be a cow which at the time of the outbreak had a damaged teat but otherwise showed no abnormality of the udder. When milk from this cow was examined bacteriologically a few days after the beginning of the epidemic it was found to contain *Str. pyogenes*. Subsequently the cow developed acute mastitis and continued to excrete streptococci for some weeks.

One of the milkers on the farm had had a sore throat shortly before the epidemic began and subsequently *Str. pyogenes* was isolated from his throat; the possibility that the cow was originally infected by this person is considered.

E. J. P.

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[**Studies Relative to the Permanency of Brucella abortus Infection.** Mitchell, C. A., and Humphreys, F. H. (1936.) Dept. of Agric. Canada, Rept. of Vety. Director-Gen. for Year Ending Mar. 31st, 1936. Appendix 3. p. 50.]

As the result of the prolonged study of three fairly large Brucella-infected herds it is concluded that only about 3 per cent. of adult bovines infected with *Br. abortus* recover and give permanently negative reactions to the agglutination test. Calves, on the contrary, usually recover, though about 15 per cent. remain infected permanently. With very few exceptions animals giving positive serological reactions are definitely infected with *Br. abortus*. About 25 per cent. of infected animals give

serological reactions fluctuating between positive and negative.

E. J. P.

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[**I.—Experiments with Crystal-violet Hog Cholera Vaccine.** Munce, T. W. (1937.) *J. Amer. Vet. Med. Ass.* N.S. **43.** 307-319; **II.—Progress in Hog Cholera Control with Tissue Vaccine.** Boynton, W. H., Woods, Gladys M., and Woods, F. W. *J. Amer. Vet. Med. Ass.* N.S. **43.** 321-325.]

I.—The method of vaccination referred to is one which was originally evolved by McBryde at the laboratories of the Bureau of Animal Industry. The vaccine consists of 10 parts of defibrinated virulent blood, 10 parts of a 1 per cent. solution of phenol, and 5 parts of a 1 per cent. aqueous solution of extra pure crystal violet, the whole being incubated at 37·5° C. for 14 days.

In an experiment designed to test the innocuity of the vaccine, eight pigs out of 58 became ill and two more died of pneumonia. There was sound evidence that these pigs were not suffering from swine fever, but Munce discusses the possibility of a state of lowered resistance due to the vaccine. Susceptible pigs in contact with the vaccinated pigs remained normal throughout the experiment. The principal experiment described is one in which groups of pigs totalling 118 were given 5 c.c. or 10 c.c. of vaccine, and their immunity tested by 48-hour contact with actively infected pigs or by inoculation of virulent blood. The results of the experiment are markedly obscured by the number of variable factors introduced, namely, that the age of the vaccine varied from one to 166 days, that the time elapsing between vaccination and the testing of immunity ranged from 21 to 201 days, that two doses of vaccine—5 c.c. and 10 c.c.—were employed, and that the test dose of virus varied from 1 to 50 c.c.

The combined results of the experiment are that out of the 118 pigs vaccinated and submitted to the test for immunity, 17·7 per cent. died, 14·4 per cent. were severely affected and 4·2 per cent. were mildly affected. There was some indication that the degree of immunity was increasing between the forty-second and ninety-first days after vaccination. A further experiment showed that simultaneous injection of serum with the vaccine had a definite detrimental effect upon the resulting immunity.

The following criticisms of the vaccine are advanced by the author: (1) That the degree of immunity developed is inadequate; (2) that, owing to the fact that crystal violet does not inhibit the growth of Gram-negative organisms, much of the vaccine would fail to pass a test for sterility at the end of the period of incubation, thus leading to a high cost of production; (3) that it is inconvenient to handle on account of its viscosity, tendency to froth and its staining properties. These criticisms are not destructive, and the author does in fact believe that the difficulties may be overcome.

II.—The disadvantages inseparable from the use of live virus in the control of swine fever are emphasised, and the preparation of tissue vaccine is described (spleen, lymph glands, kidney, testicle, spinal cord, red marrow and blood, suspended in glycerine 1 in 4, and 1 per cent. eucalyptol added). The author's description of the results obtained is of a general nature, and his conclusion is that the vaccine can be substituted satisfactorily for the serum-virus simultaneous method.

R. S. R.

REPORT

Palestine

[**Report of the Veterinary Service of the Department of Agriculture and Forests for the Year Ending March, 1935.** (Smith, J. M.) **58.** 4 annexures. Reprint extracted from the General Report of the Department of Agriculture and Forests. (1937.)]

The Chief Veterinary Officer, after introducing his report, gives the staff movements and a list of the staff, which varies little from the previous year. Under the heading of Revenue and Expenditure it is noticed that the revenue increased from £P11,800 to £P18,313. The expenditure was £P32,700.

With the exception of one outbreak of foot-and-mouth disease the country remained free from serious epizoötics. Tick-borne diseases continue to cause serious losses, particularly in imported grade cattle. Demonstration dips have considerably reduced the mortality and their construction is being encouraged and assisted. Good progress is being made with the eradication of contagious abortion and a plan is under consideration for the eradication of bovine tuberculosis, the incidence of which is said to be about 5 per cent. Anthrax causes a considerable mortality and control (by vaccination) is making good progress. Vaccines of Australian and Italian origin were used to augment the Department's laboratory supply.

The blood testing of equines for dourine was continued, infected stallions were castrated and mares branded. There was a marked increase in rabies during the year; in addition to the usual control measures an increasing number of stray dogs and jackals were destroyed. Two cases of epizoötic lymphangitis were reported and destroyed. Twenty-six outbreaks of sheep

and goat pox were dealt with. Scabies in sheep and goats has disappeared in areas where flocks are regularly dipped. Losses from parasitic gastro-enteritis in sheep and goats were insignificant owing to adverse climatic conditions. No outbreaks of blackleg, glanders, infectious pneumonia of goats or diseases of swine occurred. Fowl pox is widespread, as is spirochaetosis; pigeon pox virus vaccine is used to control the former. The Service is responsible for the health of all animals belonging to the Palestine Police and British troops.

In annexure "A" the Veterinary Pathologist again reports an increase in all kinds of routine tests. Vaccines and anti-sera were prepared for a number of diseases but laboratory facilities did not allow the demand for anti-anthrax serum to be satisfied. A great deal of investigation work was undertaken. Pulpy kidney disease (entero-toxaemia) of sheep was demonstrated for the first time. Tick fever experiments have been continued. A technique has been developed using the complement fixation and precipitin tests, to detect the meat of goats and camels when fraudulently substituted for beef. Several outbreaks of cell inclusion disease of fowls near Jaffa and Jerusalem were investigated.

A considerable increase in the importation of livestock is recorded: slaughter stock come mainly from Roumania and Bulgaria, dairy stock from Germany and most of the sheep and goats from Turkey. A large increase in the number of animals slaughtered is also recorded, coincident with the increasing population of the big towns. Meat inspection is carried out by the professional staff, assisted by trained meat inspectors; parasitic infections are the chief cause of condemnations. A further expansion of the dairy industry occurred, the wool crop also increased, and the tanning industry continued to operate satisfactorily.

The improvement of dairy cows received considerable attention, selected village cows being mated with good bulls such as pure-bred Friesians. At Acre Stock Farm various experimental herds of cattle are kept, these being of Lebanese, "boaz" from Turkey and Kerry breeds. Selected goats, sheep, pigs and horses are also kept with a view to breeding up the local stock in conjunction with the wholesale castration of scrub males. A similar policy is carried out in the poultry and bee industries, which also come under the control of the Chief Veterinary Officer. The detailed reports of the Stock Farm Manager and the Senior Poultry and Bee Keeping Officer are in annexures "B" and "C," while the statistical appendices are in "D."

[It is with satisfaction that one reads of the ramifications of the Service and the volume of the work performed.]

R. F.

N.V.M.A. DIVISIONAL REPORTS

Dumfries and Galloway V.M.A.*

MEETING AT CARLISLE

A meeting of the above Division was held in the Crown and Mitre Hotel, Carlisle, on Thursday, April 29th, 1937, the President, Mr. A. J. Kennedy, Thornhill, being in the chair.

The following members were present: Miss E. Burnett, Messrs. J. Allan, J. Bell, J. C. Bennison, J. Cameron, R. Craig Robinson, T. B. Fleming, A. Gibb, F. A. Gordon, W. T. Hewetson, A. J. Kennedy, R. E. Murison, J. Reid, Wm. Scott, R. Simpson (President, N.V.M.A.), A. Young and G. A. Sangster (Hon. Secretary).

Mr. McKinnon was present as a visitor.

Apologies for absence were received from Messrs. A. Edgar, P. McKinlay, Dr. J. Russell Greig, Messrs. Wm. Watt, T. Woodhead and A. J. Milligan.

Owing to Mr. Milligan having sustained a fracture of his arm, the Secretary was asked to convey to him the sympathy of the members.

Nomination of Member.—Mr. J. A. McKinnon was proposed by Mr. J. Cameron and seconded by Mr. Gibb.

Election of Member.—Mr. F. A. Gordon was elected a member of the Division.

N.V.M.A. Council.—Mr. R. Simpson, Carlisle, and Mr. G. A. Sangster, Dumfries, were elected to represent the Division on the Council of the National Veterinary Medical Association.

"Dick" College Extension Fund.—It was resolved to send a subscription of three guineas to the Royal (Dick) Veterinary College Extension Fund.

Summer Meeting.—It was arranged to hold the Summer Meeting of the Division in the President's town, Thornhill, late in June or early in July.

Addresses

Mr. R. Simpson, President of the N.V.M.A., in the course of a brief address, stated that he hoped as many members of the Dumfries and Galloway Division as possible would attend the Congress of the N.V.M.A. this year.

After lunch several members gave short addresses, that by Miss E. Burnett being as follows:—

Pregnancy Toxaemia or Twin Disease of Ewes

Synonyms.—Pregnancy Acidosis; Twin Trembling; White Liver.

This is a condition of in-lamb ewes, occurring usually from about three to four weeks before

*Received for publication June 22nd, 1937.

lambing, its onset often coinciding with the commencement of trough feeding. The term "Twin Disease" arises from the circumstance that this disorder is almost invariably associated with pregnancies of two or more lambs, the condition being rare in single pregnancies.

Causation.—Very little seems to be known as to the factors responsible for bringing about this condition, but it would appear that a deficiency of protein in the diet may be the determining factor. The time of the year when it is most common, February and March, is probably the period when the protein content of grass is at its lowest, and the usual supplementary feeding—oats, maize, hay and turnips—is also low in protein. Lack of exercise may also be a contributory cause, as an in-lamb ewe getting trough feeding is not inclined to move very far away from the troughs.

Symptoms.—The first noticeable symptom is that a ewe is a little slower in coming to the trough, and on closer observation it is noted that she is unable to lift her fore feet as high as usual, with the result that the toes catch the ground, producing a tripping action. If seen a few hours later, a want of co-ordination of all the limbs is evident and the ewe staggers as she progresses; the vision may be impaired, and she runs into objects without seeing them. A few hours later again, she goes down. The time that elapses from when the first symptom is seen until the ewe becomes recumbent is about 24 hours. She lies in a more or less comatose condition, there being often tympany of the rumen, the erupted ingesta coming through the nostrils. This comatose state may last from one to three or more days, generally terminating in death.

Post-mortem Appearances.—Usually the ewes are very fat, and the most common and often the only lesion is a very pale, fatty liver.

Preventative Measures.—See that the supplementary ration is rich in protein, such as bruised oats and linseed cake or fish meal, in the ratio of five to one, with the addition of clover hay. Make sure that the ewes get exercise, by driving them to the farthest field on the farm; leave the gates open and they will find their own way back to the troughs.

Treatment.—The administration subcutaneously and intramuscularly of calcium gluconate, glucose and magnesium sulphate has been tried without much success. I have had better results with a saline laxative, if given early before the comatose condition has set in.

The remaining contributors were Mr. J. C. Bennison, Carlisle, Mr. R. Craig Robinson, Carlisle, and Mr. Young, Dumfries. [The text of the addresses of these speakers is transferred to the Clinical Communications section of this issue of the *Veterinary Record.—Editor.*]

Geo. A. Sangster, *Hon. Secretary.*

Yorkshire Veterinary Medical Society*

MEETING AT WAKEFIELD

A General Meeting of the above Division was held on Friday, April 23rd, 1937, at 2.30 p.m. Members and visitors met at a farm near Wakefield, where a practical demonstration of the tuberculin test was given by Mr. R. E. Glover, M.A., B.Sc., F.R.C.V.S., assisted by the President (Major D. S. Rabagliati) and Mr. R. D. J. Brennan. There was a very large attendance of members of the Division and also of members of the North Midland Division—who had been invited—and great interest was shown by all present in the interpretation of the result of the test, as was indicated by the number of questions put to Mr. Glover. Sixteen cows, eleven heifers and 15 calves were tested by the double intradermal method and the caudal fold test was also applied to the 16 cows.

[A letter from Major Rabagliati giving the comparative results of this and a supplementary test, carried out by him on June 19th, is published in our correspondence columns.—*Editor.*]

At the conclusion of the demonstration those present adjourned to the County Hall, Wakefield, where they were entertained to tea by the President, and then the Ordinary Meeting was held in an adjacent room in the County Hall (by courtesy of the West Riding County Council).

Paper.—As it was essential for Mr. Glover to return by an early train, the President immediately called upon him to read his address on "Synthetic Tuberculin—Its Advantages and Disadvantages."

Before presenting his observations on synthetic medium tuberculin, Mr. Glover said that he had every reason to remember the cordial manner in which he had been received by the Division several years before, when he was privileged to give a short talk and demonstration on the double intradermal test. It was therefore with great pleasure that he received an invitation to address them once again, although he felt considerable diffidence in accepting—partly because he was certain that they had heard more than sufficient of the tuberculin test during the past few years, but mainly because he considered that most of his audience had had an infinitely wider experience than he upon which to draw. However, he thought that a few remarks on the newer forms of tuberculin which had recently been evolved might be of interest to them, more especially in view of the widespread interest which has been evoked by synthetic medium tuberculin.

*Received for publication June 25th, 1937.

Mr. Glover received a very hearty welcome and gave a very interesting and instructive address [reproduced at the commencement of this issue of the *Veterinary Record*] which was greatly appreciated by all present and was followed by an energetic discussion in which the following members took part: the President, Messrs. Watson, Salusbury, MacGregor and Powley. Mr. Glover replied to all the points raised in the discussion, leaving the meeting to catch his train after a very hearty vote of thanks to him, proposed by Mr. Watson and seconded by Mr. Scott, had been passed with acclamation.

ROUTINE BUSINESS

The routine business meeting then followed.

The President (Major D. S. Rabagliati) occupied the chair and the following members signed the attendance book: Messrs. A. H. Watson, H. M. Salusbury, A. D. J. Brennan, J. O. Powley, J. W. Procter, G. Whitehead, A. J. Adams, B. Holmes, E. G. Duncan, W. T. McGregor, W. Crawford, J. S. Woodrow, F. C. Fletcher, C. Holland, A. Riggs, J. M. McKellar, G. E. Simpson, H. G. Bowes, H. A. Campbell, T. C. Hall, A. Cruickshank, W. R. McKinna, F. C. Scott and E. F. McCleery (Hon. Secretary). The following were present as visitors: Messrs. G. Green, H. R. Laycock, G. D. Coward, H. B. Turkington, T. Bowett, H. Thompson, D. D. Canning, F. H. Addison and R. McNeil.

The receipt was intimated of apologies for inability to attend the meeting from Dr. Bradley, Messrs. Clarkson, Tyerman and Lieut.-Colonel Dixon.

Correspondence. — After adoption of the minutes of the last meeting, correspondence between the Hon. Secretary and the General Secretary of the N.V.M.A. with reference to a branch of the R.S.P.C.A. in Yorkshire was read and the present position explained. The correspondence, etc., was approved. The Secretary, at the request of Lieut.-Colonel Dixon, then referred to the report for the year 1936 of the branch concerned and pointed out that for some years no mention whatever had been made of the co-operation which existed between this Society and the R.S.P.C.A., and that whilst the names of the two representatives of the Society on the General Branch Committee were mentioned, it was not stated that the gentlemen were representatives of the Society. After discussion of the subject, during which the opinion was freely expressed that some reference ought to be made to this Society in the reports of the R.S.P.C.A. branch, it was unanimously agreed that in view of the present negotiations between the branch mentioned and the representatives of the N.V.M.A., no action be taken at present, but that should the negotiations referred to be successful, the Hon. Secretary take up the matter with the Hon. Secretary of the R.S.P.C.A. branch.

Representatives on the N.V.M.A. Council.—It was unanimously resolved that the President and Messrs. A. D. J. Brennan and W. R. McKinna be reappointed as the representatives of the Society on the Council of the N.V.M.A. for the year 1937-38.

Summer Meeting.—The matter of the Summer Meeting was then discussed and it was agreed that such meeting should take the form of an outing to Welbeck Abbey and Dukeries, provided that a sufficient number of members were willing to attend. Mr. Bowett very kindly undertook to make provisional enquiries on the matter, and Friday, June 18th, was provisionally agreed upon. It was also unanimously agreed that the North Midland Division be invited to join in the proposed outing and the final arrangements were left in the hands of the Presidents and Hon. Secretaries of the North Midland and Yorkshire Divisions.

On the proposition of Mr. H. M. SALUSBURY, a very hearty vote of thanks was accorded to the President for his hospitable entertainment of the company at tea.

E. F. MCCLEERY, *Hon. Secretary.*

* * * * *

Yorkshire V.M.S. and North Midland V.M.A.*

EXCURSION TO WORKSOP AND THE DUKERIES

On Friday, June 12th, a joint meeting took place between the Yorkshire Veterinary Medical Society and the North Midland Division. The meeting took the form of an excursion to Worksop and the Dukeries, there being no formal business transacted.

The party left Leeds by motor coach, picking up contingents at Wakefield, Doncaster and Worksop. Although only a comparatively small number of members were able to participate, the party, including guests, consisted of upwards of 40.

Amongst those present were Major D. S. Rabagliati (President of the Yorkshire Society), Mr. D. D. Canning (President of the North Midland), Messrs. W. R. McKinna, W. T. MacGregor, R. S. Smyth, A. D. J. Brennan, Major Holland, Messrs. G. Green, T. Bowett, A. H. Hunter, T. Ludlow and G. N. Sutherland, together with their ladies.

After partaking of lunch, which was served at the Lion Hotel, Worksop, the party visited Welbeck Abbey, entering by the Woodyard entrance after admiring the Almshouses known as The Winnings. Here, by the courtesy of the Duke of Portland, a guide was provided and the Stables and Riding School (said to be the

*Received for publication July 1st, 1937.

second largest in Europe) were visited. After this a tour was made of some of the subterranean passages, which are several miles in length, and the underground ballroom and picture galleries were shown to the visitors. In these galleries were the skins of three famous racehorses, namely, "St. Simon," "Ayrshire" and "Donovan," beautifully mounted in glass cases, as well as the famous collection of stuffed birds. A tour was then made of the gardens, including the Duchess's Garden, and by kind permission of the Duke the party was taken through the gardens close up to the house. Here a magnificent view of the surrounding deer parks and lakes was obtained. The party then re-entered the coach and visited the Major Oak in Sherwood Forest, the trunk of which measures 32 ft. in circumference: this is stated to be one of the largest and most perfect trees in the country. The company then proceeded to Edwinstowe, where tea was taken at the Dukeries Hotel. After tea a visit was made to the famous Beech Avenue, known locally as "The Natural Cathedral." On the way home the coach passed through the Lime Tree Avenue of Clumber Park, which is nearly two miles long and consists of 1,400 trees planted in double rows on each side of the drive.

A most instructive and enjoyable day was spent and the two Societies were deeply indebted to Mr. T. Bowett, of Worksop, who, through the kindness of Mr. Warner-Turner, Agent to the Portland Estate, made the necessary arrangements for visiting the various places of interest.

E. F. McCleery,
Hon. Secretary, Yorkshire V.M.S.

RACECOURSE BETTING CONTROL BOARD GRANTS

The annual report and accounts of the Racecourse Betting Control Board, for the year ended December 31st last, show that the total turnover was £7,367,925, an increase of £1,218,672 over that of the previous year. Operating expenses were £183,787, headquarters expenses £25,683, interest absorbed £78,709, and provision for income-tax £80,536.

There remained a surplus of £292,580, from which the Board decided to apply £118,814 for grants, compared with £78,838 from the 1935 surplus. The balance of £173,766 has been utilised to reduce capital expenditure. Grants for the improvement of the breeds of horses are: £6,050 to the Hunters' Improvement and Light Horse Breeding Society, £300 to the National Pony Society, £1,000 to the Shire Horse Society, and £3,500 to be devoted to the advancement of Veterinary Science and Education.

Royal College of Veterinary Surgeons

Membership Examinations, July, 1937

LIST OF SUCCESSFUL CANDIDATES

(*Continued from page* 939.)

Glasgow

FIVE YEARS' COURSE

First Year:

Anderson, A. C. (C)
†Auld, Robert
Aupret, David
Bannister, Miss J. D.
*Bhardwaj, V. R.
*Black, W. W.
*Cassells, J.
*Crosbie, Andrew
Edwards, J. R.
*Forbes, D. A.
Forsyth, A. M.
*Frith, H.
Gilmour, J. M. (C)
*Harris, G. W.
Johnston, Adam
*Juneja, G. C.
*Kinney, J. A. H.
Lauder, I. M.
Lennie, Miss M. B.
Lewis, A. C. (B)
*McGuinness, A.
McInnes, D. I.
Mackay, J. R. (C)
Mackenzie, G. A.
McLaughlan, D.
McVinnie, A. J.
Meikle, H. A. G.
Muir, R. (C)
Neil, H. J. D.
†Paterson, A. B.
Pomphrey, A. M. (C)
Sanderson, J. F. (from Edinburgh)
Samuel, Miss M. I. (B)
Semple, W.
*Shaw, D. B.
Stewart, Thomas
*Swanney, J. M.
Thomas, T. P.
Wilson, J. C. (C)
Wilson, Robert (C)
*Young, James

†Denotes First-Class Honours.
*Denotes Second-Class Honours.
(B) Denotes credit in Biology.
(C) Denotes credit in Chemistry.

Second Year:

Bennie, W. E.
Clark, John S.
Findlay, J. W. M. (P)
Grant, P. N. H.
Hay, Thomas
Jarron, J. A.
Lambie, G.
Lang, William
Logue, F. W. (P)
McCance, C. M.
McCulloch, John (P)
MacKinlay, Miss C.
MacMillan, M. M.
Mayor, O. Y.
Meikle, J. C. (P)
Miller, William (P)
Moore, C. C. S. S. A.
Morrison, A. M.
Murchison, M. M. (P)
Naismith, J. A. A.
Rankin, J. D.
Stewart, R. C. M.
Stewart, R. D.
Straiton, E. C. (P)
Thompson, J. J.
*Wilson, Andrew

*Denotes Second-Class Honours.
(P) Denotes credit in Physiology.

Animal Management

Bennie, W. E.
Baillie, Ian
Clark, John S. (credit)
Chowdhary, B. N. S.
Findlay, J. W. M.
Gorman, E.
Grant, P. N. H. (credit)
Haxton, D.
Hay, Thomas
Howatson, John
Lambie, G.
Lang, William
McCulloch, John (credit)
MacKinlay, Miss C.
Maclean, J. B. (credit)
Macleod, George
MacMillan, M. M. (credit)
Mactaggart, A.
Mayor, O. Y.
Meikle, J. C. (credit)
Miller, William
Moore, C. C. S. S. A.
Morrison, A. M.
Murchison, M. M. (credit)
O'Reilly, V. J. A. (credit)
Rankin, J. D. (credit)
Stewart, E. A.
Stewart, R. D.
Straiton, E. C.
Thompson, J. J.
Tulloch, J. A. R.
Tulloch, J. I.
Wilson, Andrew (credit)

(*To be concluded.*)

In Parliament

Milk Scheme Amendments

In the House of Commons on Friday of last week, Mr. W. S. Morrison, Minister of Agriculture, moved that the amendments of the Milk Marketing Scheme, 1933, which were presented to the House on July 16th last, be approved. He said that the two principal amendments had the effect of bringing the wholesaler with four cows into the scheme and also producers of tuberculin-tested milk. The object was to secure that this high quality of milk should be marketed through the national organisation under conditions which should encourage the continued production of this valuable article. The conditions set out in the amendments were of such a character as to provide encouragement to producers of tuberculin-tested milk to go on with their production.

With regard to the producer-retailers the Board had come to the conclusion that under present arrangements these constituents of theirs were mostly small men who were being asked to make a contribution to the cost of the scheme. As a result there would now be smaller contributions from the producer-retailers.

Mr. Alexander said that some of the amendments were less objectionable than those originally proposed before the Minister ordered a public inquiry. Nevertheless the greatest care would have to be exercised in their administration.

Mr. Macquisten said that raw fresh milk was the only milk worth drinking. Pasteurized milk was tasteless and not nourishing. It was in fact half-boiled milk, and the process of pasteurizing robbed this commodity of its benefits. The producer-retailer sold his milk fresh and in competition with the enormous vested interests which were behind the pasteurized article, and in so doing was entitled to consideration. All these marketing schemes were monstrosities and none of them could ever come to fruition.

Mr. W. S. Morrison said the Milk Board had given the producers a chance of being organised for their own protection. A poll was taken in 1935 as a result of which 81 per cent. of the producers representing 86½ per cent. of the cows voted in favour of the scheme.

The Government were not departing in the least from their endeavour to get the quality of the milk supplied by the producer-retailers up to a higher standard, and there was ample inducement given to them to go forward on the lines of progress.

The motion was agreed to.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

N.V.M.A. CONGRESS AT BOURNEMOUTH

That the "National" is a live and virile Association no member of the veterinary profession will question, but if proof were needed of the fact, a visit to the Congress at Bournemouth would provide overwhelming evidence; for, if the attendance at this year's Congress should not actually prove a record, it bids fair to emulate even the most successful of these increasingly popular annual meetings.

The powers of Nature and man have contrived to make our stay at this fashionable watering place both enjoyable physically and profitable to our mental outlook. The weather has been surprisingly gracious and Bournemouth has belied its reputation of excessive heat and relaxing air. Sunshine we have had, but in that welcome degree which, combined with moderate thermometer readings, has ensured a pleasant metabolic activity which can almost be described as bracing.

Although the Congress was officially to commence on Monday, strolling along the sea front on Saturday and Sunday the writer recognised many familiar faces and voices. On Sunday evening we assembled at the Royal Bath Hotel, where we were delightfully received, refreshed and entertained at an informal "At Home" held by what must be a record number of hosts for such a function, namely, the members of no less than five local Divisions of the "National"—the Southern Counties, South-Eastern, Sussex, Western Counties, and the Mid-West Veterinary Societies.

The Deputy Mayor (Alderman Harris) accorded a civic welcome to our members at the Town Hall at 10 a.m. on the following morning and immediately afterwards the President (Captain R. Simpson) adjourned to the Lesser Hall and proceeded to welcome the exhibitors and to declare the exhibition of drugs and surgical appliances duly open. Immediately following, a delightful little ceremony was performed by Miss Barrett who, on behalf of the exhibitors, presented Mrs. Simpson with a bouquet.

In the evening the delegates and members were received by Alderman and Mrs. Harris at a civic reception at the Pavilion, where the rhythmic strains of a dance-impelling orchestra and occupancy of the delightfully sprung floor of the ballroom brought a pleasant evening all too swiftly to a close.

The social diversions of the Congress were continued the following evening at the Royal Bath Hotel, when the President and Mrs. Simpson held their reception. If our President needed evidence of the survival of his popularity after his year of work for the Association, he received ample proof at his reception which was, though perhaps rather too crowded, an eminently popular function.

The business side of the Congress is somewhat less loaded than usual, but this is all to the good and the discussions have undoubtedly benefited thereby.

All the papers delivered thus far have drawn large attendances and stimulated good and prolonged discussions. A pleasing, but not unexpected feature, were the well-sustained discussions on "Diseases of Poultry" and "The Application of Vaccine Therapy"—papers given

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Vetiod will be found of marked service to the practitioner in the treatment of skin diseases, parasitic mange, ringworm, orbital eczema, dermatitis, wounds, abscesses, tumours, fistula, sinuses, fistulous withers, actinomycosis, simple swellings, burns, strangles, enlarged glands, grease in horses, cracked heel, capped hock, elbow bursitis, bites, tears, and inflammatory conditions generally.

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In the FEEDING BONE MEAL the natural marrow protein remains intact. With its high content of Lysine and Cystine, coupled with its range of minerals and fat, it is of great benefit to young stock as a growth-promoting foodstuff.

Literature containing full particulars of Amino Acid analyses and Metabolism trials is available on request to R. G. McQueen of

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18, Bank Street, DUMFRIES.

Sold in 7 lb. tins with measures or in 1 cwt. or ¼ cwt. bags.

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Standardized preparations of tuberculin for use in the subcutaneous, intradermic, or ophthalmic tests, are prepared in the Biological Laboratories of Parke, Davis & Co.

The strictest control by laboratory tests and tests on tuberculous animals is exercised to ensure reliability and uniformity in the P., D. & Co. diagnostic tuberculins.

Tuberculin (Veterinary) is supplied as follows:

FOR SUBCUTANEOUS TEST

20 c.c. vials (rubber-capped) of tuberculin, prepared according to the original method of Koch.

Dose: 2 to 7 c.c., according to size of animal.

FOR INTRADERMIC TEST

Rubber-capped vials of 1 c.c. or 5 c.c., sufficient for 5 or 25 double intradermic tests.

FOR OPHTHALMIC TEST

Purified tuberculin in the form of small discs for insertion into the conjunctival sac.

Vials of 10 discs sufficient for 5 double ophthalmic tests.

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in the Experimental Pathology Section. At the conclusion of its deliberations the following resolution was enthusiastically passed for presentation to the Annual General Meeting: "Whereas it has been clearly shown that some biological products at present offered for use in the control of animal diseases are devoid of essential elements, this meeting is of the opinion that the Association should urge the further extension and operation of Part II of the Diseases of Animals Act of 1935."

The paper on "The Control of Tuberculosis by Means of the Tuberculin Test" very naturally produced a lively and prolonged discussion, and the view was expressed that the time had arrived for the control of reactors to the test, since the present procedure with regard to these animals had the effect of moving the incidence of disease to other parts of the country and increased rather than diminished the total incidence.

Deserving of special mention are the admirable arrangements made by the local committee in connection with the operations and demonstrations, which were so ably carried out at the Bournemouth Corporation Stables at Winton. This afternoon was, in a way, a revelation, for all the operations and demonstrations were most speedily and efficiently carried through by comparatively young members of the profession. It almost appeared that the local committee were determined to deal the death blow to that old and fondly cherished delusion that the youth of to-day (and yesterday!) lacks the will to succeed which was traditionally so evident in our forebears.

To-day, as we go to press, the Annual General Meeting is still in session; the President has delivered a well-balanced and concise account of his stewardship during a year of what must be regarded as momentous developments for the veterinary profession. His successor will be Mr. Donald Campbell, of Rutherglen. The name of Major Rabagliati has been proposed by the newly elected President to fill the office of President-elect.

It has been decided, after some discussion, that the next meeting shall be held at Inverness, with Glasgow as an alternative in the event of accommodation at Inverness being found inadequate.

It is gratifying to know that the Minister of Agriculture (Mr. W. S. Morrison) has found it possible to fulfil his recent promise to attend the Banquet and his speech in proposing the toast of the Association is being awaited with the liveliest interest and also the prospect of further enlightenment on certain features of the Government's proposals for the establishment of a State Veterinary Service.

(*To be continued.*)

BRITISH MEDICAL ASSOCIATION

Moving the adoption of the annual report before the Representative Body at the annual conference of the British Medical Association at Belfast, Sir Kaye le Fleming (Wimborne), said that the reputation of the Association had never stood higher. They had 1,000 new members during the year, and the finances were in a highly satisfactory condition. Outstanding events of the year were the provision of a better *Journal*, which led to a great reorganisation at headquarters, and the visit of the Medical Secretary (Dr. G. C. Anderson) to India. Sir Kaye le Fleming also referred to the appointment of a standing committee of the B.M.A. and the Trades Union Congress with a view to helping in health matters the great industrial population of the country. He said he expected great results from that combination.

Dr. Colin D. Lindsay (Plymouth) was elected President of the Association for 1938-39. Dr. S. Watson Smith (Bournemouth) was elected Vice-President in recognition of his exceptional services to the Association in the world tour.

The Treasurer, Dr. N. Bishop Harman (London) said that the finances of the Association were never better. In 30 years the income and expenditure had been quadrupled.

Dr. Craig (Newcastle-on-Tyne) moved a resolution viewing with misgiving the steadily increasing expenditure, and urging that every endeavour should be made to limit it so that the subscription could eventually be lowered to two guineas, thereby ensuring an increase in membership.

Sir Kaye le Fleming said the Association could never stand still. If it was to be a live organisation, its work, expenditure, and influence would increase.

The Newcastle motion was lost, and the financial statement adopted.

Dr. Matthews presented the report of the Organisation Committee, which stated that the membership was now over 36,000, the highest figure ever recorded.

Presidential Address

The Presidential Address was delivered on the evening of Tuesday, July 20th, by Dr. R. J. Johnstone, Professor of Gynaecology, Queen's University, Belfast. His subject was "Some Thoughts on Medical Education."

The profession, he said, could not afford to recruit at a C3 standard. In this health-conscious age public authorities were constantly launching one health scheme after another. As experts they asked for their collective advice to be taken and for their collective services to be employed. But the administrator had the last word, and while the specialist or the whole-time officer was practically immune from criticism, the incompetence or the carelessness of a few could be alleged as a reason for excluding the whole class of general practitioners from participation in a service. They were asking for their rights; but rights involved responsibilities.

The critic of the medical curriculum assumed generally that teachers at the end of five years should turn out a finished product, and went on to blame them because they did not produce a finished general practitioner. No one expected them to turn out at the end of the five years a finished surgeon or anatomist or pathologist. Everyone recognised that to form a specialist years of post-graduate study and experience were required. Were they to take it that the path which the general practitioner must follow to reach the mastery of his art was shorter and less steep than that trodden by the specialist? He should say "No."

Just as the finished surgeon must have had responsible experience of surgery, the finished general practitioner must have had responsible experience of general practice. The undergraduate's horizon was limited by the threatening figures of a court of examiners. Only when that grim spectre had faded was he free to take a view of the responsibilities which he must shoulder throughout the rest of his professional life—responsibility to his patients, to his own reputation, and, most important of all, to his own private conscience. The better trained the young graduate, the more quickly and the more competently did he take up the burden.

A probationer nurse and a medical student had each approximately three years of clinical experience. The nurse's opportunities for clinical observation were infinitely better than those of the student. Everyone must acknowledge with gratitude the debt that we owed to the trained nurse for her help in diagnosis, in prognosis, and in treatment. But did her unrivalled clinical experience qualify her to take on the function of a medical practitioner? She would herself be the first to say "No." She lacked the background, the background of human anatomy and physiology and pathology, of knowledge of the human body in health and in disease, which the medical student had gained with much toil and sweat and against which his clinical observations were composed and the picture interpreted. It was the main business of a medical education to provide an adequate background and to teach how it should be used, and the more competently that work had been done the more valuable would his clinical experience be to the practitioner.

"The general practitioner," the President continued, "is still with us, and I ask myself, How does he compare with his predecessor of a generation back? His equipment is undoubtedly better, he has for the service of his patients a store of knowledge and an acquaintance with technical resources not even dreamt of when I was a medical student. But I take down a volume written more than 40 years ago by one who had been a patient of many doctors, and when I read his judgment on our profession I realise that in the eyes of the patient—a critic who must not be lost sight of—qualities are at least as important as technical accomplishments."

Influenza Virus

In the Section of Pathology, Bacteriology and Immunology Dr. C. H. Stuart-Harris read a paper on "Epidemic Influenza." He said that the principal question had been whether influenza virus infection in man constituted a clinical entity or not. Experience in a further epidemic and in the civil population would have to be gained before the tentative conclusion that it did constitute an entity could be proved.

Dr. C. H. Andrewes read a paper on "Influenza: Four Years' Progress," in which he discussed experimental work carried out jointly by himself and his colleagues, Dr. Wilson Smith, Sir Patrick Laidlaw and Dr. Stuart-Harris. Having described the disease in ferrets and the adaptation of the virus to mice, he offered a summary of the evidence upon which was based the conviction that the virus under study was the primary cause of influenza in man.

In the course of this he mentioned that last year an accident completed their chain of evidence. A ferret infected with a virus which had been passed in series through 196 ferrets sneezed upon Dr. Stuart-Harris and produced in him a typical attack of the disease. There was no influenza prevalent at the time, and the virus recovered was distinguishable by its biological effects from ordinary strains of human origin. There was, therefore, almost no room for doubt that Dr. Stuart-Harris's infection actually came from the ferret.

The speaker added that preliminary attempts at vaccinating human beings against the virus had been made. Last December, he said, it was arranged through the co-operation of the Army authorities to vaccinate five groups, each of about 100 men. There was, however, suggestive evidence that the vaccine was not as good as they should like it to be. Four persons, vaccinated at least a fortnight beforehand, nevertheless developed clinical influenza, and from them they obtained the virus.

* * * * *

PERSONAL

Colonel Bowes' Services to Agriculture in Yorkshire.—"Lieut.-Colonel H. G. Bowes, F.R.C.V.S., retires from the University Lectureship in Veterinary Hygiene in September next, under the age limit, and his retirement marks the end of a long period of distinguished service in Yorkshire agriculture," states *The Pateley Bridge Herald*. "He is well known to Nidderdale farmers, whom he has addressed on more than one occasion. Meanwhile his past and present colleagues have responded to a very evident desire that tribute should be paid to his work and have appointed a committee to arrange for a suitable testimonial."

. . . . .

Forthcoming Marriage.—The marriage between Mr. W. D. Schofield, A.C.G.I., of Lincoln, and Miss E. K. Finke, M.R.C.V.S., of Harrow, will take place at St. Mary's Church, Harrow-on-the-Hill, on Thursday, August 5th, at 12 o'clock.

* * * * *

THE VALUE OF VETERINARY RESEARCH IN THE DEVELOPMENT OF PASTORAL INDUSTRIES

In our columns during recent weeks we have emphasised the necessity for veterinary research in the development of our pastoral industries; accordingly we reproduce below the major portion of an article which appeared in the *Rhodesia Herald*, of May 7th, 1937, in which the contributor has much to say concerning research which is applicable not only to Southern Rhodesia but to other parts of the British Dominions.

In a leading article the *Rhodesia Herald* asked us to consider the annual bill of this small country of Southern Rhodesia alone in seeking to control disease, and urged the claims of research work, not only on grounds of humanitarianism and progress, but as a means of saving a tremendous cost to humanity.

It was asked further whether enough funds are available to permit research in general to go forward at the pace which is needed, whether all those engaged in research are able to give to the work that undivided and concentrated attention which it ought to receive, whether we ought not to set up further facilities, and whether in so doing we could not enlist further practical interest from outside organisations and institutions which have both the men and the money.

It is the hope that this article will give some idea of the bill which we are paying because research has not yet been able to go far enough, and that it will offer useful suggestions with regard to the manner in which further progress may be achieved.

Rhodesia's Problem

It can but be admitted that the progress of this country since its inception has been slow compared with that of other colonised countries in the past. In seeking a cause for this unsatisfactory state of affairs, it will be found that the diseases of man, animals and plants have played an all-important part. They have undermined too much of the health and energy of the white population; decimated and retarded the growth of our stock; impeded the progress of the pastoral industry; and interfered with the general development of trade and commerce. Even our crops have not been spared.

To emphasise the point, it is only necessary to refer to malaria, bilharzia, and the obscure anaemias of man; rinderpest, East Coast fever, foot-and-mouth disease of cattle, and the verminous diseases of sheep; eel-worm, mosaic, and angular spot of tobacco; diplodia zoeae of maize and rust of wheat. Locusts and tsetse flies may be cited as examples of the insect pests which have been sent to try us.

The settler, however, has not yielded to adversity. He has made a gallant stand against it. Governments, like individuals, have made a sincere effort to cope with these problems, and have spent very large sums of money in the attempt to eliminate or control them.

The Public Health Department, the Veterinary Department, the Veterinary Research Department, the Divisions of Entomology and of Plant Pathology, the Tobacco Research Station at Trelawney, locust destruction, and tsetse fly operations, are all units in an immense organisation engaged in a constant effort to control disease of one sort or another.

These things relate to the control of disease and not to the cost of medical aid necessary to maintain the community in a state of health and efficiency. In one way and another, probably not less than a quarter of a million pounds, and possibly considerably more, is spent annually by the 54,000 European inhabitants of this country, in the endeavour to keep themselves in a state of good health, and this in addition to the sum spent on the administrative control of disease. So that directly, and indirectly through taxation, the public is paying more than half a million pounds per annum on disease control and medical aid.

This is not to say that our case is unique; every country has its problems of disease and its "patching up process" on which very large sums are annually spent. But the point is: cannot we take steps which will avoid the necessity for this expense? And this is where research comes in.

The chief reason why our pests and disease persist, and why it is so difficult to apply effective measures to cure or control, is that many of them present some unknown feature which stultifies our efforts. For administrative as well as curative measures to be successful must be based upon an exact scientific knowledge of the diseases it is sought to control. In the absence of such knowledge they remain, the expenditure upon efforts to cope with them becomes recurrent, and the progress of the country is indefinitely retarded. It, therefore, becomes an urgent necessity to obtain such knowledge, for until we possess it there will always be found some weak link in our armour.

Such knowledge can only be acquired by intensive research. But in these days of rapid scientific progress it is recognised that no man can possess a complete knowledge of every subject. It is an age of specialisation, and it is as much as one man can do, if he desires to do it well, to specialise in one subject at a time.

Also, in studying any particular pathological problem it is desirable to do so from different angles, comparing notes and putting knowledge together like the pieces of a jig-saw puzzle, until a complete and true picture is presented.

It is more and more being realised that to obtain the best and quickest results in scientific research, co-ordinated team work is desirable.

Whole-time Workers

It is obvious, therefore, that our local problems can best be solved by whole-time workers with a special training and aptitude for research and a specialised knowledge of the subject or branch of the subject they are required to study, and free from the irksome restrictions inseparable from official research.

The study of disease, moreover, can no longer be conducted in scientific watertight compartments. The diseases of man, animals and plants are so closely allied that they not only run parallel but frequently converge. For example, one cannot study trypanosomiasis in one species without taking into consideration its behaviour in another. Similarly, there are virus diseases of man, animals and plants. The study of the virus of mosaic of tobacco might reveal important facts applicable to, say, foot-and-mouth disease or any other of the innumerable virus diseases.

Therefore, close collaboration is necessary between those who seek to solve the various problems presented by different diseases, for a worker in one direction may often help a worker in another. Thus it would be an advantage to have a team of workers under one roof, each acting as a part of a well-directed and adequately-equipped organisation. And as far as possible their efforts should be concentrated upon the most pressing problems affecting this country.

It may be asked, from whence are these specialists to be obtained? This should present no difficulties. There is a vast army of specialists in every branch of science awaiting, like Alexander, "new fields to conquer." But even the scientist is "worthy of his hire," and cannot live on enthusiasm and hope alone.

The difficulty of cost might, perhaps, be overcome by inviting the holders of Fellowships and Grants from the many Trusts and Endowments, as for example the Beit, Leverhulme and Carnegie Trusts, or scholars from universities, schools and other institutions, to work on our problems and in this country. All that would remain for us to do would be to provide the accommodation, equipment and facilities, and correlate their efforts and their results.

Even to-day there are some who affect to despise scientific research. They regard the scientist as a mere theorist comparing unfavourably with themselves, the "practical" men. But the present age is an age of scientific progress, and those that do not advance with it must eventually be left behind.

There are some who consider the old methods superior to the new. Let them remember the days before Jenner introduced vaccination against smallpox; Pasteur, Koch and others, who

discovered the microbial origin of disease; and Lister who applied their theories to surgery. Let our farmers remember what they owe to Bordet, Danys and Theiler who devised the serum inoculation against rinderpest, Watkins-Pitchford who worked out the scientific reasons for dipping for the destruction of ticks, Alexander and Du Toit who have recently discovered a method of immunising equines against horse-sickness, Nuttall and Hadwen who introduced the trypan-blue treatment of redwater in cattle and "biliary fever" of dogs.

Let them consider the thousand and one triumphs which stand to the credit of medical research, and they will be forced to the conclusion that the time has arrived when we should endeavour to obtain a more accurate knowledge of the diseases which have affected us in the past, are still with us, and which retard our progress.

In other words, let them realise that the best form of insurance for the future lies in intensive and co-ordinated scientific research. It was Pasteur who said: "Laboratories and discoveries are correlative terms: if you suppress laboratories, physical science will become stricken with barrenness and death; it will become mere powerless information instead of a science of progress and futurity; give it back its laboratories, and life, fecundity and power will reappear."

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ARMY VETERINARY SERVICE

Promotion Examination Results

In the examination (in written subjects) of officers with a view to promotion in the Regular Army and Indian Army, which was held in India and Burma in March last, the following officers were successful:—

Royal Army Veterinary Corps.—Majors W. E. Barry and W. L. Sinton; Lieuts. E. H. Lewis Bowen and A. D. Seton.

Indian Army Veterinary Corps.—Lieuts. Munir Ahmed, Farzand Ali, H. L. Bhandari, M. Y. Khan, M. Z. Khan, D. R. Masson, M. Masud, K. P. Nair, R. K. Sethi and K. B. Singh.

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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YORKSHIRE VETERINARY MEDICAL SOCIETY: DEMONSTRATIONS OF THE TUBERCULIN TEST

To the Editor of the Veterinary Record

Sir,—I shall be glad if you can see your way to publish this letter with the accompanying table, for the information of certain of your readers.

On April 23rd last [as recorded elsewhere in this issue—*Editor*], at a meeting of the Yorkshire Veterinary Medical Society, a tuberculin test was carried out on a farm near Wakefield and Mr. R. E. Glover, of the Institute of Animal Pathology, Cambridge, most kindly came to demonstrate the results.

For the information of members and others who were present I would say that a second test was carried out by me on June 19th on all the cattle of the same herd, excluding the reactors to the first test. The following table shows the result of the two tests, the first figures in each column being the April readings and the second those of June.

No.	Description.	Measurements in mm.						Result.	
		Initial.		48 Hrs.		72 Hrs.			
	Cows:								
1	Light roan ...	5		6		10		R	
2	Black	7	7	8	12	10	18	D	R
3	Strawberry roan	8		9		11		R	
4	White	8	8	8	14	8	18	—	R
5	Red and white...	7		8		12		R	
6	White	7		9		12		R	
7	Blue roan ...	7	7	8	7	8	8	—	—
8	Red	9	8	9	8	10	9	—	—
9	Dark blue roan	6	6	6	6	9	7	—	—
10	Light roan ...	6	6	8	12	10	14	D	R
11	White	7	7	9	7	9	9	—	—
12	Red and white...	8	7	8	7	9	7	—	—
13	Roan	7	7	9	8	10	9	—	—
14	Roan	6	6	6	8	8	12	—	R
15	Roan	8	8	8	9	10	9	—	—
16	Red, white markings ...	7	7	8	8	9	8	—	—
	Heifers:								
17	Blue roan ...	9	8	9	8	10	9	—	—
18	Red and white...	8	8	9	9	9	9	—	—
19	White	9	9	11	10	11	10	—	—
20	Red and white... (Down horn)	10	9	10	9	11	10	—	—
21	Roan (large) ...	9	7	10	8	11	8	—	—
22	Red and white...	8	8	8	8	9	8	—	—
23	White (small)...	8	8	9	8	9	8	—	—
24	Roan (small) ...	8	7	8	7	9	8	—	—
25	Roan (thin)	Sub-caudal fold only.							
26	Roan.	Sub-caudal fold only.							
27	Young bull ...	8		9		10			

R = Reactor. D = Doubtful. — = Negative.

It will be seen that the two cows Nos. 2 and 10, classified as "Doubtful" in April, both failed to the second test, as also did two cows, Nos. 4 and 14, which passed the April test.

The 15 calves were also re-tested and again all passed successfully.

The original heifers, Nos. 25 and 26, and the young bull, No. 27, of the first test, had been disposed of and thus were not re-tested.

D. S. Rabagliati,
Chief Veterinary Officer.

Veterinary Department,
County Hall,
Wakefield.

July 7th, 1937.